

# THE NEUTRON WARHEAD: STORMY PAST, UNCERTAIN FUTURE

by

LIEUTENANT COLONEL ALEX A. VARDAMIS, US ARMY

**T**he neutron warhead exploded in a headline on page one of *The Washington Post* on 6 June 1977: "Neutron Killer Warhead Buried in ERDA Budget." The most controversial weapons system since the hydrogen bomb was thus introduced to an unwitting public, press, Congress, and President.<sup>1</sup> The reader learned that the United States was about to begin production "of its first nuclear battlefield weapon specifically designed to kill people through the release of neutrons." The theme that the "neutron killer warhead" is "anti-people," that it is more "inhumane" than other nuclear weapons, was repeated in numerous press releases in the summer of 1977. In an editorial in the *Post* on 8 June, it was described as a "precise killer" which could be construed as a "grisly" chemical and biological weapon, and "just about the last thing anyone should want for the American arsenal."<sup>2</sup> An editorial in *The Christian Science Monitor* on 15 July included the comment that "There is no question the neutron bomb, which is designed to wreak more destruction on people than property, is morally abhorrent."<sup>3</sup>

What made the neutron warhead appear even more insidious was the alleged employment of secrecy to slip it past an unwary President and Congress. On 21 June, an article in the *Post* headlined "Senate Pressed for Killer Warhead" stated that "Neither President Carter nor Defense Secretary Harold Brown knew that money for its production was in the fiscal 1978 budget they had reviewed until news reports appeared two weeks ago."<sup>4</sup> On 24 June, *Post* readers learned that "The Pentagon is proceeding in great secrecy to produce

neutron 'killer' shells for its nuclear artillery forces in Europe."<sup>5</sup> On 25 June, the *Post* headlined an article: "Pentagon Wanted Secrecy on Neutron Bomb Production."<sup>6</sup> In a follow-up article on 1 July, the *Post*, following a lead from the Pentagon, now referred to the warhead as an "enhanced radiation weapon" and quoted freely from an Army publication to graphically describe how radiation kills.<sup>7</sup>

Congress was divided on the issue. On 1 July, Senator John Stennis told reporters that the neutron warhead was "the best news I have heard in years." But Senator John Heinz found the weapon "even more repugnant than usual . . . literally dehumanizing." Senator Mark Hatfield, who was to lead Senate opponents of the warhead, declared that "Everything up to this point has been more by discovery than by information. We discovered that it was in the budget. We discovered that no President had ever approved it. This whole thing has stumbled into our life." He concluded that "My ultimate hope is that this weapon never enters the arsenal."<sup>8</sup>

In a press conference on 6 July, Presidential Press Secretary Jody Powell defended development of the new weapon and denied the suggestion that it might have an adverse effect on SALT negotiations. When asked if a neutron warhead could be mounted on a strategic missile, he testily replied: "If you wanted to put a peanut on a trailer."<sup>9</sup>

In an extraordinary closed-door session, Congress voted 43 to 42 to permit the President to decide whether to go ahead with production. Despite this congressional action and executive support, the controversy still

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flared. On 7 July, a group of demonstrators, after an overnight vigil, flung vials of blood against Pentagon entranceway pillars to protest the new weapon. On 8 July, *The New York Times* described the weapon as “a virtual death ray.”<sup>10</sup> Finally, during a news conference on 12 July, the President stated that he felt the neutron bomb should be “one of our options,” but he “allowed that any use of this type of weapon could lead to worldwide holocaust.”<sup>11</sup> On that very same day, General Alexander Haig, Supreme Allied Commander, Europe, told reporters that the neutron warhead was “needed to modernize NATO’s tactical nuclear weapons in Europe.”<sup>12</sup>

**B**y and large, members of the press and perhaps a significant portion of our populace remain unconvinced. In an ironic, black-humor article appearing in *The New York Times* on 26 July, Yorick Blumenfeld adopted the persona of a victim of one of “NATO’s neutron nukes” who still has a few moments before his death to scribble out a farewell to the world:

I realize that I have much to be grateful for to the Americans. My life may have been terminated, but even the clothes on my back are intact. So are my compositions. The house I have lived in, with all its books, paintings and photographs—my life’s work, as it were—are untouched. What more can a man ask for from a war? . . . Why should the buildings and real estate suffer? Let people kill people—if necessary—but there is no reason we should take the planet with us.<sup>13</sup>

As perceived by some, the neutron bomb is the ultimate weapon of capitalism: It kills people but preserves property. But recalling Premier Khrushchev’s bellicose threats to blow up the Parthenon, if necessary, in a nuclear attack on culture, one realizes that possible future use of neutron weapons may not be restricted to capitalist nations. One wonders whether the civilized world would have recoiled with such horror had Khrushchev threatened to destroy Athenians

but to leave Athens intact? In such an Alice-in-Wonderland world of logic, so runs the argument, the city is more valuable than its citizens. Better that Parisians die than Paris be destroyed; better New Yorkers than New York.

From such extremes has the controversy raged. Battlelines of emotion have been drawn in the Congress, the press, and consequently in the public mind. Those at the Pentagon, in attempting to explain rationally the military advantages of a neutron weapon, have often unintentionally fueled the simmering debate. For example, consider the selection of the nomenclature. The “enhanced radiation weapon” could have been as easily—and as truthfully—labelled a “reduced blast” warhead. But it wasn’t. Or consider the hasty explanations that the neutron bomb “would not be fired alone, but as a part of a package of perhaps 30-50 nuclear shells and warheads, possibly including some of the enhanced radiation variety.”<sup>14</sup> Such a scenario can hardly be called reassuring.

Partly because of the anger and emotion that has surrounded this issue, some important questions have not been addressed. Will introduction of neutron warheads into our nuclear inventory in NATO increase the chances of escalating a conventional war into a nuclear war? Will they increase NATO’s deterrence against a Warsaw Pact attack? Are the warheads militarily effective? How will their deployment affect our NATO allies? How are the Soviets apt to react to this new development? Such questions are admittedly more prosaic than discussions of “death rays” and “killer warheads,” but they should be addressed before we go ahead with production, and particularly before the weapons are deployed in Europe. The future of the neutron weapon is, at the time of this writing, by no means secure. Since it represents an innovative technical development in tactical nuclear weapons, it poses some real and immediate issues dealing with our concept of limited nuclear war and our deterrence in Europe; it deserves a sober, careful consideration, not only as a weapon of war, but also as an instrument of foreign policy.

## BY DEFINITION

What is the neutron bomb? It might be easier to state what it is not. First of all, it is not technically a bomb, but a missile warhead. The weapon is not a new concept; the neutron principle has been around since the first atomic bomb. The neutron warhead is not a chemical-biological weapon. To compare it with poison gas, as some opponents of the neutron bomb have done, is to confuse the basic distinction between nuclear weapons and chemical-biological weapons. The neutron warhead releases a single, lethal flash of radiation which leaves virtually no residual contaminating radioactivity. Finally, the weapon is not strategic. It is currently designed to be used on the tactical battlefield against enemy troops, not against enemy population centers, fixed installations, airfields, and the like.

Simply stated, the neutron principle switches a greater portion of the energy of a nuclear explosion away from blast, heat, and radioactive fallout towards instant, high-energy radiation. Unlike the current crop of low-yield fission weapons, the neutron warhead derives its effects primarily from nuclear fusion. As explained in a recent issue of *The Bulletin of the Atomic Scientists*:

Fission warheads release only about 5 percent of their total yield . . . in the form of prompt nuclear radiation, while [enhanced radiation] warheads release about 80 percent of their yield in the form of very high doses of neutrons and gamma radiation. These new warheads are also different because of the low proportion of energy released in the form of blast and thermal radiation. . . .<sup>15</sup>

From the military point of view, the neutron warhead is perceived as particularly useful against a Warsaw Pact armor threat against NATO, for it kills tank crews with greater precision than can the current fission weapons. A small neutron warhead involves a blast and fireball effect for only a relatively short range, while releasing a stream of neutrons which can penetrate live cells over a

much greater area. If a current nuclear weapon were used to achieve the same radiation effect, its blast and heat effects would kill people and destroy buildings far beyond the range of the killing neutrons.

A term frequently used to describe the side effects of a nuclear explosion is collateral damage. Undesirable collateral damage is, obviously, the destruction of civilians or friendly troops in the proximity of a nuclear blast. Target analysts, in accordance with United States policy, attempt to restrict undesirable collateral damage. But, in order to destroy a target with a fission weapon, the destructive radius would sometimes include friendly people and property. The neutron warhead improves targeting options and would greatly reduce the problem of collateral damage. It could be used effectively on advancing Soviet tank columns without harming nearby cities and towns. Comparatively speaking, the neutron warhead is more efficient. Coupled with the Lance missile, for which one version of the weapon has been designed, the neutron warhead can be detonated with lower yields than the standard fission version over an advancing tank column. An added advantage is that because the level of radioactive contamination is low, the target can be reoccupied very rapidly.

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The current inventory of tactical nuclear weapons in Europe could cause considerable collateral damage; so much so, argue some, that it makes them almost unusable. The United States Army, which has already replaced the aging Honest John and Sergeant missiles with Lance, sees the advantages of the neutron warhead as greater flexibility, improved accuracy, smaller yields, and less collateral damage. It is considered to be a plausible, practical, and usable weapon on the European battlefield. But characterizing the neutron warhead as usable causes opponents of the weapon to tremble.

### PRO AND CON

Proponents of the neutron warhead, who tend to be believers in the possibility of tactical nuclear war, argue that because the warhead is more precise, "cleaner," and less destructive as an explosive—because it is smaller and more controllable—it is more usable than a fission weapon. In the face of a Warsaw Pact armor thrust into NATO, it is more apt to be given a green light from the National Command Authority than would imprecise, "dirty" tactical nuclear weapons. Furthermore, argue proponents of the neutron warhead, it is more humane. Current nuclear weapons kill primarily from blast, heat, and collapsing buildings; the neutron warhead accomplishes its killing through high doses of radiation. Therefore, proponents argue, it is more humane because it would cause fewer civilian deaths; because the casualties, mostly enemy soldiers, would be selected with "surgical" precision; because the destruction would be confined to that necessary to thwart the enemy advance; and because the collateral damage to population centers adjacent to the battlefield would be held to a minimum.

Opponents of the weapon argue, quite to the contrary, that it is an inhumane weapon which, because it is usable, is to be particularly dreaded. They conceive that a slow, painful death by radiation is hardly more humane than an instant death by blast or heat. An enemy soldier's death by neutron radiation would depend on the radiation dose

he were to receive, which would vary depending on his particular proximity to ground zero. On one extreme, he would become almost immediately incapacitated and remain so until his certain death in one or two days. However, if he were on the outer periphery of the radiation kill radius, he might become functionally impaired within two hours of exposure and not die for several weeks.<sup>16</sup> In any event, the victim's terminal "illness" would be painful and slow. Yet deliberations on the preferability of one manner of dying over another, reminiscent of Frost's poem, "Fire and Ice," are for most military planners quite pointless. They reply that we should not ignore the ultimate purpose of weapons of war.

Critics of the neutron warhead also fear that erroneous perceptions of the weapon's "humanity" will drag us into a nuclear war, because it gives rise to the plausibility of a controllable, tactical nuclear war. Senator Hatfield outlined this argument to reporters:

There is a feeling that this is a more humane weapon because it is more precise in its target. Because it is more precise, however, there is more temptation to use it . . . and once we introduce nuclear weaponry into conventional warfare, we're on our way.<sup>17</sup>

The corollary to this argument is that the current fission weapons cause a high level of collateral damage and are thus unlikely to be used; consequently, they act as an inhibitor to limited nuclear war. Whereas the neutron warhead blurs the distinction between conventional and nuclear warfare, our current nuclear inventory clearly does not. Therefore, say critics, the neutron warhead lowers the nuclear threshold.

To counter this fear, proponents of the neutron warhead point out that the President of the United States retains final authority to release US nuclear weapons, including all neutron warheads. His decision to resort to the use of any nuclear weapon, anywhere in the world, would be of such immense consequence that whether the first US nuclear weapon fired in anger is a neutron warhead would be a very minor perturbation, in

relation to the overshadowing decision to go nuclear. As long as our chief executive clearly understands that neutron warheads do not blur the distinction between conventional and nuclear warfare—that the neutron warhead is, indeed, a full-fledged nuclear weapon—the nuclear threshold is not lowered.

On the other hand, if neutron warheads are available, the President might, in a deteriorating military situation in Europe, be more vigorously urged by NATO political and military leaders to go nuclear. One of the attractive features of neutron warheads is, supposedly, that they are more usable. Clearly, though, President Carter fully understands the implications of the neutron warhead and would only resort to the use of nuclear weapons—of any variety—in the gravest of circumstances. As he stated in a news conference on 11 July: “The ownership of atomic weapons and their potential use is such a horrifying prospect . . . that it is a deterrent to a major confrontation between nations who possess atomic weapons.”<sup>18</sup> But what of a future President, perhaps less concerned with the distinction between large conventional weapons and small neutron warheads? Tempting, it would certainly be, to use a “clean,” humane neutron weapon on an enemy force attempting to occupy friendly territory—particularly with the assurance that collateral damage would be nil. To gain perspective, it is interesting to speculate whether there might have been a role for neutron warheads in Vietnam. The battle of Khe Sanh, for example, where tactical nuclear weapons were an option, comes to mind. At any rate, some argue that over the long term the introduction of neutron warheads into our nuclear inventory will lower the nuclear threshold because, curiously, they are less objectionable, more precise, “cleaner,” and cause less collateral damage than do current fission weapons.

#### DETERRENCE AND MILITARY EFFECTIVENESS

Does the neutron warhead increase NATO's deterrence against a Warsaw Pact attack? Proponents of the weapon say that because it is perceived to be more usable it is a

more credible deterrent. And, we remind ourselves, it is more usable principally because it reduces collateral damage. Soviet military doctrine, however, gives little evidence of concern for collateral damage, particularly on West German soil. And, unlikely as the prospect of a Soviet military attack on NATO now appears, we can be certain that should it occur, it will be violent in execution. The sudden, overwhelming armored blitzkrieg the Soviets envision reveals little regard for restricting damage to the immediate battlefield. Such a scrupulous concern for a “clean,” humane war is typically one-sided. However, since the NATO alliance is defensive in nature, any war will necessarily take place on allied soil, where we are understandably more interested in reducing collateral damage than are the Soviets. Perhaps we, too, would be less concerned, if the *locus operandi* were Warsaw Pact territory. We must conclude, though, that proposals of reduced collateral damage will do little to deter Warsaw Pact aggression.

On the other hand, that the neutron warhead is more usable than fission weapons and more effective against tank formations must give the Soviets pause. Not surprisingly, Soviet leadership has opposed our development of a weapon that threatens their present four-to-one superiority in tank divisions; they perhaps recognize that we are likely to use the neutron warhead on the tactical battlefield. If the Soviets truly fear that the neutron warhead could play an important role in stopping an attack, they could either be deterred against aggression or they could launch preemptive strikes against our nuclear ammunition sites and then proceed as planned. To the degree that the Soviets believe that the neutron warhead is militarily effective, usable, and survivable, they will be that much deterred. Not much, one suspects. But as unlikely, even insane, as such an attack may appear, should the Warsaw Pact decide to carry it out, they will not hesitate very much because we possess the neutron warhead. In their planning, it is merely another nuclear weapon that will have to be dealt with if and when the time comes.

How militarily effective is the neutron

warhead? Will it kill tank crews and personnel in armored personnel carriers as it is reputed to be able to do? Predictions of its effectiveness must, necessarily, remain in the realm of conjecture, because we cannot be sure what percentage of an advancing tank column will be immediately incapacitated. Certainly with the greater precision the Lance missile affords over the Honest John, coupled with the reduced blast and heat effects of the neutron warhead, we can anticipate that an armored attack can be engaged with precision, relatively unrestricted by the concern over collateral damage to friendly population centers. We know that a one-kiloton neutron warhead delivers about 8000 rads to exposed individuals within one-half mile of the explosion, and that someone subjected to such a dose is incapacitated within minutes and dies in one or two days.<sup>19</sup> The tank provides next to nothing in the way of protection against neutron radiation. Current Soviet armor, although possessing some defense against chemical, biological, and radiological effects, simply cannot handle prompt neutron radiation. To significantly reduce the penetrating power of neutrons, protective layers of metal, concrete, and boron would have to be incorporated into the tank or armored personnel carrier, thus making it far too cumbersome to move. Under the current state of the art of radiation protection, including all the materials currently known to man, very little can be done to protect tank and armored personnel carrier crews from prompt radiation.

On the other hand, the destructive force of the neutrons rapidly diminishes with distance from ground zero. Whereas tank crews near the center of the blast will be immediately incapacitated, those on the periphery, while perhaps receiving a lethal dose, probably will be physically able to continue the attack.

Herbert Scoville, formerly deputy director of the CIA, is among those who question the weapon's military effectiveness. He points out that casualties "receiving even 10 times a lethal neutron radiation dose would still continue to fight effectively for about half an hour and only die a day or so later."

Additionally, those "receiving just a lethal dose will continue to function for several hours and would not die for weeks."<sup>20</sup> A curious residue of terminally ill Warsaw Pact soldiers would be instantly created by the detonation of an enhanced radiation weapon—potential suicide squads, bereft of hope, perhaps psychologically disoriented to the point of ineffectiveness but, on the other hand, probably bent on revenge. The neutron warhead could spawn a new variety of walking-wounded, soon to die, but well enough to fight. New technology has enhanced the kill radius of the neutron warhead over that of earlier versions; however, because it remains more benign as an explosive, it cannot completely destroy an enemy armored attack. The point is, it is not the ultimate weapon and would, most likely, be employed in conjunction with fission warheads as part of an overall defensive plan involving a cluster of nuclear weapons.

No one can possibly predict the course of a limited tactical nuclear war in Europe. If one believes in the concept of such a war, then the neutron warhead, mated to the Lance missile, could be an effective tool in helping to defend against a Warsaw Pact armored threat. However, questions of field deployment, command and control, security, transportation, and US custody should be addressed. Before we can be certain that the neutron warhead will be militarily effective in NATO, we should carefully reexamine the entire US Army tactical nuclear support structure to insure we are not merely putting "new wine in old bottles."

## THE VIEW FROM NATO

How will the introduction of the neutron warhead into the US nuclear inventory in Europe affect our NATO allies? First of all, we should avoid treating NATO as a uniform entity speaking with one voice. Who speaks for NATO? The Council of Ministers? The national political leaders? The military? And of which country? Great Britain? West Germany? Obviously there are many opinions, many voices. Probably the majority of Europeans are not fully aware of

the large US nuclear presence in Europe, and certainly the average citizen was not consulted to begin with. One would assume, however, that the Europeans would select, given an either-or choice, the neutron warhead over any other nuclear weapon in our current inventory. Certainly this would hold true for citizens of those countries who are likely to find themselves the hosts, as it were, of a tactical nuclear war. For example, a 10-kiloton fission weapon would level nearly every building for a mile or more—densely urbanized Western Europe would suffer heavily in a tactical nuclear war.

Tony Geraghty, defense correspondent of *The London Sunday Times*, points out the staggering loss of life to be expected in West Germany in the event of a tactical nuclear war with fission weapons. Quoting from the results of a NATO nuclear war game, Geraghty notes that “355 nuclear bombs would be used within three days and . . . 268 of them would descend on West Germany, killing more than 1.5 million people.”<sup>21</sup> A *Götterdämmerung!* But Germany would not suffer alone. The Netherlands, for example, has the highest population density of any country in Europe. The greatly reduced collateral damage to be expected from neutron warheads would, one assumes, win for them high approval from European civilians, at least. Self-interest being a strong motive, though, the further removed one’s own country is from the anticipated nuclear battlefield, the less influenced one will be by the prospects of reduced collateral damage.

If our European allies perceive that we will more readily use the neutron warhead in their defense, they may conclude that it is a more effective deterrent against a Soviet attack. However, we must realize that our NATO allies view the role of US tactical nuclear weapons in Europe somewhat differently than we do. This was as pointed out in a report prepared for the Committee on Foreign Relations of the United States Senate in April 1977:

The European NATO members have traditionally considered theater nuclear forces . . . a key connection between the

conventional forces and the United States strategic deterrent. Because of this, the Europeans are less interested in battlefield [tactical nuclear] weapons . . . but rather favor longer-range systems capable of either delivering strategic strikes, if necessary, or at least capable of extending the battle beyond the immediate battlefield.<sup>22</sup>

Since NATO is already heavily committed to the protection of US nuclear forces, it is hard to see why they would object to the introduction of the US neutron warhead onto European soil. So far as our allies’ past actions permit us to predict the future, we can be reasonably sure that they ultimately will be supporters of the neutron warhead. The United States, on the other hand, should not act unilaterally in introducing it into Europe. We should clearly explain to our NATO allies that the neutron warhead is merely another option, another tool with which to fight a tactical nuclear war. We should clearly communicate to them that any claims that the weapon is cleaner, more humane, and more precise may be subsumed into irrelevancy by the greater dangers it may spawn. But since our allies are perhaps as realistic and clearheaded about the dangers of nuclear war as we are, and since they understand the nature of the Communist threat at least as well as we do, we probably will not have to tell them anything. They already know.

Because of real economic and political problems on the domestic front, some members of NATO may be only too eager to seize upon the neutron warhead as a pretext to cut back on conventional forces. If the new weapon is as effective as its proponents claim, then why not, they will argue, rely upon it to replace NATO troops on line in Western Europe? Few would dispute that a strong NATO conventional military force acts as a powerful deterrent against a Warsaw Pact attack. In a news conference on 12 July 1977, President Carter even went so far as to declare that NATO has “adequate force strength to stop an invasion by Warsaw Pact forces” with or without nuclear weapons.<sup>23</sup> Allowing for a measure of political hyperbole justified, in part, to reassure our friends and



caution our foes, we are counting on at best a conventional parity in Europe and at worst Warsaw Pact supremacy discounted by US tactical nuclear weapons. Our allies might conclude that if our deterrent force is dramatically improved through the introduction of the neutron warhead, then conventional force can be reduced. Such a conclusion could lead to a dangerous weakening of NATO's conventional force which would, in the long run, be a more serious blow to the collective security of the Western World than would the loss of a single warhead system. The United States must reemphasize that nuclear weapons, enhanced radiation or otherwise, are not a substitute for conventional forces. They are a supplement.

### **SALT, MBFR, AND LARGER ISSUES**

Will the introduction of US neutron warheads into Europe adversely affect SALT and MBFR? Probably not. First of all, since the neutron warhead is not a strategic weapon, it poses little threat to SALT. It obviously offers no direct nuclear threat to the Soviet Union. As for MBFR, it is difficult to see why a reduced blast and heat weapon which reduces collateral damage by some 80 percent would meet with objection, since it satisfies arms control objectives of reducing the destructiveness of a tactical nuclear war. Furthermore, no limits have ever been agreed to in deploying tactical nuclear weapons, so no treaty can be violated by the introduction of the neutron warhead into Europe. Arms control impact statements submitted to the United States Senate clearly illustrate that the official US view perceives the neutron warhead as no threat to our arms control negotiations with the Soviets.

The weapon does provide the Soviets with a convenient pretext for moral outrage, and they probably will seize upon it as a propaganda device. Why should they ignore the publicity value in condemning a weapon that would subject Soviet soldiers to a slow and painful death? But in the long run, their blustering will probably have little effect, for one cannot help but remind them that their

soldiers will be perfectly safe if they stay off NATO soil.

Does the neutron warhead, as a technological breakthrough, raise any larger issues that transcend the NATO battlefield? First of all, because it is perceived as less dangerous and cleaner than other nuclear weapons, it is well suited to limited war in a number of areas of the globe. A nuclear weapon which reduces collateral damage while maintaining lethality against personnel, and which can be employed in counterinsurgency operations without subjecting friendly villages to destruction, would be a useful tool in certain conflicts in South America, Africa, the Middle East, and other areas. We should expect that, over the next decades, the neutron principle will contribute to nuclear proliferation. And there may be nothing we can do to prevent it.

There is probably little value in the Soviets developing a tactical neutron warhead for the European battlefield. Assumedly, their theater nuclear weapons are planned for deep interdiction against preplanned targets. Here, low yield weapons would be inadequate, and collateral damage is not a factor. The Soviet stockpile of over 5000 warheads is fine for their purposes. But a strategic neutron warhead, even though such a development may lie far in the future, is another matter. What could be more desirable, from the point of view of a nation bent on conquest, than a weapon which kills the enemy but spares his cities, military installations, factories, mines, and communications networks? As Professor Eric Burhop, a nuclear weapons pioneer, argues: "It is the weapon par excellence of the aggressor who is determined to take over intact cities and industries of another country."<sup>24</sup> If past experience in the arms race is a guide, we can be almost certain that ingenious scientists will further develop the neutron warhead to make it suitable for a strategic role. It is simply too lucrative a weapon of aggression to pass up.

**W**here does that leave us? One suspects that the production of neutron warheads has a momentum of its own that cannot be slowed. From a military point of view, they will provide, at least in the

midterm, an improvement in the effectiveness of our nuclear delivery systems. Although they are somewhat more credible than the fission weapons in our current inventory, their presence, alone, will not substantially deter a Warsaw Pact attack. Should deterrence fail, they might represent an increase in NATO's ability to deny the enemy his military objectives, temporarily at least, with comparatively low levels of collateral damage.

However, with the risks involved, before we deploy the neutron warhead to NATO we should review our entire policy concerning US tactical nuclear weapons in Europe. Can we really defend, as the President suggests, without our nuclear delivery systems? As a minimum, we should carefully reexamine our conventional and nuclear force posture in Europe and, with the full participation of our NATO allies, decide exactly what we propose to do with these weapons. The introduction of the neutron warhead into the public consciousness now permits a free and open debate, not only on the warhead itself, but on a broader question: Do we really believe in a controllable, limited, tactical nuclear war?

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19. Miettinen, p. 35.
20. Tony Geraghty, "Neutron bomb: How Europe sees it," *Boston Globe*, 18 August 1977, p. 15.
21. *Ibid.*
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24. Geraghty, p. 15.

